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Commissioner for Patents, P.O. Box 1450, Mail Stop Reissue
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Applicant(s): Shen et al
US Patent No: 5,573,648
Title: Gas Sensor Based on Protonic Conductive Membranes

Atty. PDM
Docket No.: 011361.00064
Issue Date: 11/12/96

The following has been received in the U.S. Patent and Trademark Office on the date stamped hereon:

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_X_ Reissue Application Fee Transmittal Form _1_ pg (duplicate)

_X_ Other Reissue Application Transmittal Letter (2pgs), Power of Attorney or Authorization of Agent Form (2pgs), Reissue Application Declaration by the Assignee (8pgs), Chart Showing Differences in Claim Language between the Original Patent Claims and the Presented Reissue Claims (395pgs), Reissue Application Consent of the Assignee (1pg), Certificate Under 37 C.F.R. § 3.73(b) (11pgs), Preliminary Amendment (25pgs), Copy of Specification, Figures and Claims of US Patent No. 5,573,648 (18pgs), and Statement Under 37 C.F.R. § 1.178(b) (2pgs)

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee: **Shen et al.**

Assignee: **Atwood Mobile Products, Inc.**

U.S. Patent No.: **5,573,648** **Date Issued:** **November 12, 1996**

Application No.: **381,718** **Date Filed:** **January 31, 1995**

Title: **GAS SENSOR BASED ON PROTONIC CONDUCTIVE MEMBRANES**

****

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(v) Reissue Application Declaration by the Assignee (8 pages);
(vi) Chart Showing Differences in Claim Language between the Original Patent Claims and the Presented Reissue Claims (395 pages);
(vii) Reissue Application Consent of the Assignee (1 page);
(viii) Certificate Under 37 C.F.R. § 3.73(b) (11 pages);
(ix) Preliminary Amendment (25 pages);
(x) Copy of Specification, Figures and Claims of U.S. Patent No. 5,573,648 (18 pages);
(xi) Statement Under 37 C.F.R. § 1.178(b) (2 pages); and
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee: **Shen et al.**

Assignee: **Atwood Mobile Products, Inc.**

U.S. Patent No.: **5,573,648** **Date Issued:** **November 12, 1996**

Application No.: **381,718** **Date Filed:** **January 31, 1995**

Title: **GAS SENSOR BASED ON PROTONIC CONDUCTIVE MEMBRANES**

****

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P.O. Box. 1450
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TRANSMITTAL LETTER FOR REISSUE APPLICATION OF U.S. PATENT No. 5,573,648

Dear Sir:

Enclosed for filing please find the following reissue application papers for the above referenced patent:

(i) Return Receipt Postcard;

(ii) Reissue Application Fee Transmittal Form;

(iii) Power of Attorney or Authorization of Agent Form;

(iv) Reissue Application Declaration by the Assignee;

(v) Chart Showing Differences in Claim Language between the Original Patent Claims and the Presented Reissue Claims;

(vi) Reissue Application Consent of the Assignee;

(vii) Certificate Under 37 C.F.R. § 3.73(b);

(viii) Preliminary Amendment;

(ix) Copy of Specification, Figures and Claims of U.S. Patent No. 5,573,648;

(x) Statement Under 37 C.F.R. § 1.178(b); and

(xi) Certificate of Express Mail.

The Commissioner is hereby authorized to charge all fees or credit overpayments to Deposit Account No. 19-0733.

Respectfully submitted,
Shen et al.

Date: 17 July 2003

By: [signature]

Peter D. McDermott (Reg. No. 29,411)
Attorney for Applicants
BANNER & WITCOFF, LTD.
28 State Street, 28th Floor
Boston, MA 02109
Phone: (617) 720-9600
Fax: (617) 720-9601

PTO/SB/56 (08-00)
Approved for use through 12/30/2000. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

REISSUE APPLICATION FEE TRANSMITTAL FORM

Docket Number (Optional): 011361.00064

Claims as Filed - Part 1

Claims in Patent		Number Filed in Reissue Application	(3) Number Extra	Small Entity Rate	Small Entity Fee		Other than a Small Entity Rate	Other than a Small Entity Fee
(A) 78	Total Claims (37 CFR 1.16(j))	(B) 88	**** 10 =	x $____ =		or	x $ 18 =	180
(C) 4	Independent claims (37 CFR 1.16(i))	(D) 9	* 5 =	x $____ =			x $ 84 =	420
			Basic Fee (37 CFR 1.16(h))	$____				$ 750
			Total Filing Fee	$			OR	$ 1,350

Claims as Amended - Part 2

	(1) Claims Remaining After Amendment		(2) Highest Number Previously Paid For	(3) Extra Claims Present	Small Entity Rate	Small Entity Fee		Other than a Small Entity Rate	Other than a Small Entity Fee
Total Claims (37 CFR 1.16(j)	***	MINUS	**	* =	x $____ =			x $____ =	
Independent Claims (37 CFR 1.16(i))	***	MINUS	*****	=	x $____ =			x $____ =	
				Total Additional Fee		$		OR	$

* If the entry in (D) is less than the entry in (C), Write "0" in column 3.

** If the "Highest Number of Total Claims Previously Paid For" is less than 20, Write "20" in this space.

*** After any cancellation of claims.

**** If "A" is greater than 20, use (B - A); if "A" is 20 or less, use (B - 20).

***** "Highest Number of Independent Claims Previously Paid For" or Number of Independent Claims in Patent (C).

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ Please charge Deposit Account No. ________________ in the amount of ____________.
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☒ The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 or 1.17 which may be required, or credit any overpayment to Deposit Account No. 19-0733.
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☐ Payment by credit card. Form PTO-2038 is attached.

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17 July 2003
Date

Signature of Applicant, Attorney or Agent of Record

Peter D. McDermott (Reg. No. 29,411)
Typed or printed name

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REISSUE APPLICATION FEE TRANSMITTAL FORM

Docket Number (Optional): 011361.00064

Claims as Filed - Part 1

Claims in Patent		Number Filed in Reissue Application	(3) Number Extra	Small Entity Rate	Small Entity Fee		Other than a Small Entity Rate	Other than a Small Entity Fee
(A) 78	Total Claims (37 CFR 1.16(j))	(B) 88	**** 10 =	x $____ =		or	x $ 18 =	180
(C) 4	Independent claims (37 CFR 1.16(i))	(D) 9	* 5 =	x $____ =			x $ 84 =	420
			Basic Fee (37 CFR 1.16(h))	$____				$ 750
			Total Filing Fee	$			OR	$ 1,350

Claims as Amended - Part 2

	(1) Claims Remaining After Amendment		(2) Highest Number Previously Paid For	(3) Extra Claims Present	Small Entity Rate	Small Entity Fee		Other than a Small Entity Rate	Other than a Small Entity Fee
Total Claims (37 CFR 1.16(j)	***	MINUS	**	* =	x $____ =			x $____ =	
Independent Claims (37 CFR 1.16(i))	***	MINUS	*****	=	x $____ =			x $____ =	
				Total Additional Fee		$		OR	$

* If the entry in (D) is less than the entry in (C), Write "0" in column 3.

** If the "Highest Number of Total Claims Previously Paid For" is less than 20, Write "20" in this space.

*** After any cancellation of claims.

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***** "Highest Number of Independent Claims Previously Paid For" or Number of Independent Claims in Patent (C).

☐ Applicant claims small entity status. See 37 CFR 1.27.

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17 July 2003
Date

[signature]
Signature of Applicant, Attorney or Agent of Record

Peter D. McDermott (Reg. No. 29,411)
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Application Number	Reissue of US 5,573,648
Filing Date	Herewith
First Named Inventor	Yousheng Shen
Title	See Attachment 1
Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	011361.00064

I hereby appoint:

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as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

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I am the:

[ ] Applicant/Inventor.

[X] Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name	David Bovee, Vice President, Dura Automotive Systems, Inc.		
Signature	[signature]		
Date	7 Jul 4 2003	Telephone	

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[X] *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Addendum

Attachment 1

Gas Sensor Based on Protonic Conductive Membranes

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee:	**Shen et al.**		
Assignee:	**Atwood Mobile Products, Inc.**		
U.S. Patent No.:	**5,573,648**	**Date Issued:**	**November 12, 1996**
Application No.:	**381,718**	**Date Filed:**	**January 31, 1995**

Title: **GAS SENSOR BASED ON PROTONIC CONDUCTIVE MEMBRANES**

****

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P.O. Box. 1450
Alexandria, VA 22313-1450

<u>REISSUE APPLICATION DECLARATION BY THE ASSIGNEE</u>

Dear Sir:

I, David Bovee, hereby declare that:

1. Dura Automotive Systems, Inc. is authorized to act on behalf of Atwood Mobile Products, Inc. Atwood Industries, Inc. made a capital contribution of all its assets to Atwood RV Products, Inc. Atwood RV Products, Inc. merged with two other companies and subsequently changed its name to Atwood Mobile Products, Inc. I am authorized to act on behalf of Dura Automotive Systems and the title of my position with Dura Automotive Systems, Inc. is Vice President.

2. This declaration is being filed to complete the requirements for filing a reissue application for the above-referenced patent. I understand that the assignee of entire interest is authorized to make this declaration for reissue application under 37

C.F.R. § 1.172(a) because the reissue application is not seeking to enlarge the scope of the claims.

3. I believe the inventors to be the original and first inventors of the subject matter that is described and claimed in the above-referenced patent, for which a reissue patent is sought on the invention referenced above.

4. A copy of the specification, figures, abstract and claims of U.S. Patent No. 5,573,648 is attached hereto.

5. I have reviewed and understand the contents of the specification, figures, abstract and claims of the above-referenced patent and the claims presented in the preliminary amendment filed with this declaration.

6. A chart showing the differences in claim language between the original patent claims and claims 79-88 presented in the reissue application is attached to this declaration. Because presented reissue claims 1-78 are exactly the same as original patent claims 1-78, respectively, these claims have been omitted from the chart.

7. I acknowledge my duty to disclose information that is material to patentability as defined in 37 C.F.R. § 1.56.

8. I verily believe the original patent to be wholly or partly inoperative or invalid by reason of the patentee claiming less than he had the right to claim in the patent.

In particular, patentee failed to claim a two-electrode electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising: a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with

the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim an electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising: a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim a two-electrode electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising: a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting

material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim an electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising: a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim an electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising: a porous mixed ionic-electronic conductive

sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane and the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim an electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising: a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane and the sensing electrode reacting with the gas in the absence of an applied voltage to the sensing electrode.; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects

changes in said electrical characteristic. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim an electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising: a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas in the absence of an applied voltage to the sensing electrode; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means

for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode, in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage. Such error arose without any deceptive intention on the part of the patentee.

Patentee also failed to claim non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material; a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material; a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm; the sensing electrode reacting with the gas to produce a change in an

electrical characteristic between the sensing electrode and the counter electrode, in which the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode; means for electrical measurement; said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage. Such error arose without any deceptive intention on the part of the patentee.

9. All errors corrected in the reissue application arose without deceptive intention on the part of the Applicant.

10. All statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

7 July 2003
Dated

David Bovee
Vice President, Dura Automotive Systems, Inc.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	79	Unlike original patent claim 1, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane."
2	79	Unlike original patent claim 2, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 2, presented reissue claim 79 does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."
3	79	Unlike original patent claim 3, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 3, presented reissue claim 79 does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	79	Unlike original patent claim 4, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 4, presented reissue claim 79 does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	79	Unlike original patent claim 5, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 5, presented reissue claim 79 recites the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
6	79	Unlike original patent claim 6, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 6, presented reissue claim 79 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	79	Unlike original patent claim 7, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 7, presented reissue claim 79 does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	79	Unlike original patent claim 8, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 8, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	79	Unlike original patent claim 9, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 9, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	79	Unlike original patent claim 10, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 10, presented reissue claim 79 recites the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	79	Unlike original patent claim 11, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 11, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	79	Unlike original patent claim 12, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 12, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	79	Unlike original patent claim 13, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 13, presented reissue claim 79 does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	79	Unlike original patent claim 14, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 14, presented reissue claim 79 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	79	Unlike original patent claim 15, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 15, presented reissue claim 79 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	79	Unlike original patent claim 16, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 16, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	79	Unlike original patent claim 17, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 17, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	79	Unlike original patent claim 18, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 18, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	79	Unlike original patent claim 19, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 19, presented reissue claim 79 does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	79	Unlike original patent claim 20, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 20, presented reissue claim 79 does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	79	Unlike original patent claim 21, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 21, presented reissue claim 79 does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	79	Unlike original patent claim 22, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 22, presented reissue claim 79 does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	79	Unlike original patent claim 23, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 23, presented reissue claim 79 does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	79	Unlike original patent claim 24, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 24, presented reissue claim 79 does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	79	Unlike original patent claim 25, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 25, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	79	Unlike original patent claim 26, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 26, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	79	Unlike original patent claim 27, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 27, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes.
28	79	Unlike original patent claim 28, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 28, presented reissue claim 79 does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	79	Unlike original patent claim 29, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 29, presented reissue claim 79 does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	79	Unlike original patent claim 30, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 30, presented reissue claim 79 does not recite the language "said sensing and counter electrodes having electrically connected therebetween said means for electrical measurement; means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	79	Unlike original patent claim 31, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 31, presented reissue claim 79 does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	79	Unlike original patent claim 32, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 32, presented reissue claim 79 does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	79	Unlike original patent claim 33, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 33, presented reissue claim 79 does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	79	Unlike original patent claim 34, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 33, presented reissue claim 79 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	79	Unlike original patent claim 35, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 35, presented reissue claim 79 does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	79	Unlike original patent claim 36, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 36, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	79	Unlike original patent claim 37, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 37, presented reissue claim 79 does not recite the language "rein the electrochemical gas sensor is adapted to detect hydrogen."
38	79	Unlike original patent claim 38, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 38, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	79	Unlike original patent claim 39, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 39, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	79	Unlike original patent claim 40, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 40, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	79	Unlike original patent claim 41, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," and also recites the language the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane."
42	79	U Unlike original patent claim 42, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," and also recites the language the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 40, presented reissue claim 79 does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	79	Unlike original patent claim 43, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 43, presented reissue claim 79 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	79	Unlike original patent claim 44, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 44, presented reissue claim 79 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	79	Unlike original patent claim 45, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 45, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	79	Unlike original patent claim 46, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 46, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	79	Unlike original patent claim 47, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 47, presented reissue claim 79 does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	79	Unlike original patent claim 48, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane."
49	79	Unlike original patent claim 49, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor" and recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 49, presented reissue claim 79 does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	79	Unlike original patent claim 50, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 50, presented reissue claim 79 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	79	Unlike original patent claim 51, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 51, presented reissue claim 79 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	79	Unlike original patent claim 52, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 52, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	79	Unlike original patent claim 53, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 53, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	79	Unlike original patent claim 54, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 54, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	79	Unlike original patent claim 55, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 55, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	79	Unlike original patent claim 56, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 56, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	79	Unlike original patent claim 57, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 57, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	79	Unlike original patent claim 58, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 58, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	79	Unlike original patent claim 59, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 59, presented reissue claim 79 does not recite the language "a porous mixed ionic-electronic conductive reference electrode having both an electronic conducting material and an ionic conducting material" and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	79	Unlike original patent claim 60, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 60, presented reissue claim 79 does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	79	Unlike original patent claim 61, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 61, presented reissue claim 79 does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	79	Unlike original patent claim 62, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 62, presented reissue claim 79 does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	79	Unlike original patent claim 63, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 63, presented reissue claim 79 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	79	Unlike original patent claim 64, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 64, presented reissue claim 79 does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
65	79	Unlike original patent claim 65, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 65, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	79	Unlike original patent claim 66, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 66, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	79	Unlike original patent claim 67, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 67, presented reissue claim 79 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	79	Unlike original patent claim 68, presented reissue claim 79 recites the language “a two-electrode electrochemical gas sensor,” recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike, original patent claim 68, presented reissue claim 79 does not recite the language “wherein the electrochemical gas sensor is adapted to detect H_2S.”
69	79	Unlike original patent claim 69, presented reissue claim 79 recites the language “a two-electrode electrochemical gas sensor,” recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike original patent claim 69, presented reissue claim 79 does not recite the language “wherein the electrochemical gas sensor is adapted to detect H_2O vapor.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	79	Unlike original patent claim 70, presented reissue claim 79 recites the language “a two-electrode electrochemical gas sensor,” recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike, original patent claim 70, presented reissue claim 79 does not recite the language “wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm.”
71	79	Unlike original patent claim 71, presented reissue claim 79 recites the language “a two-electrode electrochemical gas sensor,” recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike original patent claim 71, presented reissue claim 79 does not recite the language “wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	79	Unlike original patent claim 72, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 72, presented reissue claim 79 does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	79	Unlike original patent claim 73, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 73, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	79	Unlike original patent claim 74, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 74, presented reissue claim 79 does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	79	Unlike original patent claim 75, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 75, presented reissue claim 79 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	79	Unlike original patent claim 76, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 76, presented reissue claim 79 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	79	Unlike original patent claim 77, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 77, presented reissue claim 79 does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	79	Unlike original patent claim 78, presented reissue claim 79 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 78, presented reissue claim 79 does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	80	Unlike original patent claim 1, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
2	80	Unlike original patent claim 2, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 80 does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
3	80	Unlike original patent claim 3, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 80 does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	80	Unlike original patent claim 4, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 80 does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	80	Unlike original patent claim 5, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 80 does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
6	80	Unlike original patent claim 6, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 80 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	80	Unlike original patent claim 7, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 80 does not recite the language" wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	80	Unlike original patent claim 8, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	80	Unlike original patent claim 9, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	80	Unlike original patent claim 10, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	80	Unlike original patent claim 11, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	80	Unlike original patent claim 12, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	80	Unlike original patent claim 13, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 80 does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	80	Unlike original patent claim 14, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 80 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	80	Unlike original patent claim 15, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 80 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	80	Unlike original patent claim 16, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	80	Unlike original patent claim 17, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	80	Unlike original patent claim 18, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	80	Unlike original patent claim 19, presented reissue claim 80 recites the language “the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 19, presented reissue claim 80 does not recite the language “wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon.”
20	80	Unlike original patent claim 20, presented reissue claim 80 recites the language “the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 20, presented reissue claim 80 does not recite the language “wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	80	Unlike original patent claim 21, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 80 does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	80	Unlike original patent claim 22, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 80 does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	80	Unlike original patent claim 23, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 80 does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	80	Unlike original patent claim 24, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 80 does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	80	Unlike original patent claim 25, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	80	Unlike original patent claim 26, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	80	Unlike original patent claim 27, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes."
28	80	Unlike original patent claim 28, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 80 does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	80	Unlike original patent claim 29, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 80 does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	80	Unlike original patent claim 30, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 30, presented reissue claim 80 does not recite the language "means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	80	Unlike original patent claim 31, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 31, presented reissue claim 80 does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	80	Unlike original patent claim 32, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 32, presented reissue claim 80 does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	80	Unlike original patent claim 33, presented reissue claim 80 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike original patent claim 33, presented reissue claim 80 does not recite the language “wherein said sensing and counter electrodes comprise conductive metal oxides.”
34	80	Unlike original patent claim 34, presented reissue claim 80 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike original patent claim 34, presented reissue claim 80 does not recite the language wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	80	Unlike original patent claim 35, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 35, presented reissue claim 80 does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	80	Unlike original patent claim 36, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 36, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	80	Unlike original patent claim 37, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 37, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."
38	80	Unlike original patent claim 38, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 38, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	80	Unlike original patent claim 39, presented reissue claim 80 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike original patent claim 39, presented reissue claim 80 does not recite the language “wherein the electrochemical gas sensor is adapted to detect H_2O vapor.”
40	80	Unlike original patent claim 40, presented reissue claim 80 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means.” Unlike original patent claim 40, presented reissue claim 80 does not recite the language “wherein the electrochemical gas sensor is adapted to detect NO_x.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	80	Unlike original patent claim 41, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
42	80	Unlike original patent claim 42, presented reissue claim 80 recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 42, presented reissue claim 80 does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	80	Unlike original patent claim 43, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 43, presented reissue claim 80 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	80	Unlike original patent claim 44, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 44, presented reissue claim 80 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	80	Unlike original patent claim 45, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 45, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	80	Unlike original patent claim 46, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 46, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	80	Unlike original patent claim 47, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 47, presented reissue claim 80 does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	80	Unlike original patent claim 48, presented reissue claim 80 recites the language "presented reissue claim 80 recites the language the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
49	80	Unlike original patent claim 49, presented reissue claim 80 recites the language "presented reissue claim 80 recites the language the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 49, presented reissue claim 80 does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	80	Unlike original patent claim 50, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 50, presented reissue claim 80 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	80	Unlike original patent claim 51, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 51, presented reissue claim 80 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	80	Unlike original patent claim 52, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 52, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	80	Unlike original patent claim 53, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 53, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	80	Unlike original patent claim 54, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 54, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	80	Unlike original patent claim 55, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 55, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	80	Unlike original patent claim 56, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 56, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	80	Unlike original patent claim 57, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 57, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	80	Unlike original patent claim 58, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 58, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	80	Unlike original patent claim 59, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 59, presented reissue claim 80 does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	80	Unlike original patent claim 60, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 60, presented reissue claim 80 does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	80	Unlike original patent claim 61, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 61, presented reissue claim 80 does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	80	Unlike original patent claim 62, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 62, presented reissue claim 80 does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	80	Unlike original patent claim 63, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 63, presented reissue claim 80 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	80	Unlike original patent claim 64, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 64, presented reissue claim 80 does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
65	80	Unlike original patent claim 65, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 65, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	80	Unlike original patent claim 66, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 66, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	80	Unlike original patent claim 67, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 67, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	80	Unlike original patent claim 68, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 68, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	80	Unlike original patent claim 69, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 69, presented reissue claim 80 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	80	Unlike original patent claim 70, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 70, presented reissue claim 80 does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	80	Unlike original patent claim 71, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 71, presented reissue claim 80 does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	80	Unlike original patent claim 72, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 72, presented reissue claim 80 does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	80	Unlike original patent claim 73, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 73, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	80	Unlike original patent claim 74, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 74, presented reissue claim 80 does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	80	Unlike original patent claim 75, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 75, presented reissue claim 80 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	80	Unlike original patent claim 76, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 76, presented reissue claim 80 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	80	Unlike original patent claim 77, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 77, presented reissue claim 80 does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	80	Unlike original patent claim 78, presented reissue claim 80 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 78, presented reissue claim 80 does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	81	Unlike original patent claim 1, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
2	81	Unlike original patent claim 2, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 81 does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
3	81	Unlike original patent claim 3, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 81 does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	81	Unlike original patent claim 4, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 81 does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	81	Unlike original patent claim 5, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 81 does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
6	81	Unlike original patent claim 6, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 81 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	81	Unlike original patent claim 7, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 81 does not recite the language" wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	81	Unlike original patent claim 8, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	81	Unlike original patent claim 9, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	81	Unlike original patent claim 10, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	81	Unlike original patent claim 11, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	81	Unlike original patent claim 12, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	81	Unlike original patent claim 13, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 81 does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	81	Unlike original patent claim 14, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	81	Unlike original patent claim 15, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 81 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	81	Unlike original patent claim 16, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	81	Unlike original patent claim 17, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	81	Unlike original patent claim 18, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	81	Unlike original patent claim 19, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 19, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	81	Unlike original patent claim 20, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 20, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	81	Unlike original patent claim 21, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	81	Unlike original patent claim 22, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 81 does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	81	Unlike original patent claim 23, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	81	Unlike original patent claim 24, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 81 does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	81	Unlike original patent claim 25, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	81	Unlike original patent claim 26, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	81	Unlike original patent claim 27, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes."
28	81	Unlike original patent claim 28, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 81 does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	81	Unlike original patent claim 29, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 81 does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	81	Unlike original patent claim 30, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 30, presented reissue claim 81 does not recite the language "means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	81	Unlike original patent claim 31, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 31, presented reissue claim 81 does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	81	Unlike original patent claim 32, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 32, presented reissue claim 81 does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	81	Unlike original patent claim 33, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 33, presented reissue claim 81 does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	81	Unlike original patent claim 34, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 34, presented reissue claim 81 does not recite the language wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	81	Unlike original patent claim 35, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 35, presented reissue claim 81 does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	81	Unlike original patent claim 36, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 36, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	81	Unlike original patent claim 37, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 37, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."
38	81	Unlike original patent claim 38, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 38, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	81	Unlike original patent claim 39, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 39, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	81	Unlike original patent claim 40, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 40, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	81	Unlike original patent claim 41, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," and recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
42	81	Unlike original patent claim 42, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," and recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 42, presented reissue claim 81 does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	81	Unlike original patent claim 43, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 43, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	81	Unlike original patent claim 44, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 44, presented reissue claim 81 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	81	Unlike original patent claim 45, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 45, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	81	Unlike original patent claim 46, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 46, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	81	Unlike original patent claim 47, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 47, presented reissue claim 81 does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	81	Unlike original patent claim 48, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
49	81	Unlike original patent claim 49, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 49, presented reissue claim 81 does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	81	Unlike original patent claim 50, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 50, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	81	Unlike original patent claim 51, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 51, presented reissue claim 81 does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	81	Unlike original patent claim 52, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 52, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	81	Unlike original patent claim 53, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 53, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	81	Unlike original patent claim 54, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 54, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	81	Unlike original patent claim 55, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 55, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	81	Unlike original patent claim 56, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 56, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	81	Unlike original patent claim 57, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 57, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	81	Unlike original patent claim 58, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 58, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	81	Unlike original patent claim 59, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 59, presented reissue claim 81 does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	81	Unlike original patent claim 60, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 60, presented reissue claim 81 does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	81	Unlike original patent claim 61, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 61, presented reissue claim 81 does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	81	Unlike original patent claim 62, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 62, presented reissue claim 81 does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	81	Unlike original patent claim 63, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 63, presented reissue claim 81 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	81	Unlike original patent claim 64, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 64, presented reissue claim 81 does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
65	81	Unlike original patent claim 65, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 65, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	81	Unlike original patent claim 66, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 66, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	81	Unlike original patent claim 67, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 67, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	81	Unlike original patent claim 68, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 68, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	81	Unlike original patent claim 69, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 69, presented reissue claim 81 does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	81	Unlike original patent claim 70, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 70, presented reissue claim 81 does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	81	Unlike original patent claim 71, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 71, presented reissue claim 81 does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	81	Unlike original patent claim 72, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 72, presented reissue claim 81 does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	81	Unlike original patent claim 73, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 73, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	81	Unlike original patent claim 74, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 74, presented reissue claim 81 does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	81	Unlike original patent claim 75, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 75, presented reissue claim 81 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	81	Unlike original patent claim 76, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 76, presented reissue claim 81 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	81	Unlike original patent claim 77, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 77, presented reissue claim 81 does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	81	Unlike original patent claim 78, presented reissue claim 81 recites the language "a two-electrode electrochemical gas sensor," recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 78, presented reissue claim 81 does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	82	Unlike original patent claim 1, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 1, presented reissue claim 82 does not recite the language "quantitative measurement."
2	82	Unlike original patent claim 2, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 2, presented reissue claim 82 does not recite the language "quantitative measurement," does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."
3	82	Unlike original patent claim 3, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 3, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	82	Unlike original patent claim 4, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 4, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	82	Unlike original patent claim 5, presented reissue claim 82 recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane.” Unlike original patent claim 5, presented reissue claim 82 does not recite the language “quantitative measurement,” and also does not recite the language “wherein said sensing and counter electrodes comprise conductive metal oxides.”
6	82	Unlike original patent claim 6, presented reissue claim 82 recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane.” Unlike original patent claim 6, presented reissue claim 82 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	82	Unlike original patent claim 7, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 7, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	82	Unlike original patent claim 8, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 8, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	82	Unlike original patent claim 9, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 9, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	82	Unlike original patent claim 10, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 10, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	82	Unlike original patent claim 11, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 11, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	82	Unlike original patent claim 12, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 12, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	82	Unlike original patent claim 13, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 13, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	82	Unlike original patent claim 14, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 14, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	82	Unlike original patent claim 15, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 15, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	82	Unlike original patent claim 16, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 16, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	82	Unlike original patent claim 17, presented reissue claim 82 recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane.” Unlike original patent claim 17, presented reissue claim 82 does not recite the language “quantitative measurement,” and also does not recite the language “wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide.”
18	82	Unlike original patent claim 18, presented reissue claim 82 recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane.” Unlike original patent claim 18, presented reissue claim 82 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	82	Unlike original patent claim 19, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 19, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	82	Unlike original patent claim 20, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 20, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	82	Unlike original patent claim 21, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 21, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	82	Unlike original patent claim 22, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 22, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	82	Unlike original patent claim 23, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 23, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	82	Unlike original patent claim 24, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 24, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	82	Unlike original patent claim 25, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 25, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	82	Unlike original patent claim 26, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 26, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	82	Unlike original patent claim 27, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 27, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes.
28	82	Unlike original patent claim 28, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 28, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	82	Unlike original patent claim 29, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 29, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	82	Unlike original patent claim 30, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 30, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "said sensing and counter electrodes having electrically connected therebetween said means for electrical measurement; means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	82	Unlike original patent claim 31, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 31, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	82	Unlike original patent claim 32, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 32, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	82	Unlike original patent claim 33, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 33, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	82	Unlike original patent claim 34, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 34, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	82	Unlike original patent claim 35, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 35, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	82	Unlike original patent claim 36, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 36, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	82	Unlike original patent claim 37, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 37, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "rein the electrochemical gas sensor is adapted to detect hydrogen."
38	82	Unlike original patent claim 38, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 38, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	82	Unlike original patent claim 39, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 39, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	82	Unlike original patent claim 40, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 40, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	82	Unlike original patent claim 41, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 41, presented reissue claim 82 does not recite the language "quantitative measurement."
42	82	Unlike original patent claim 42, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 42, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	82	Unlike original patent claim 43, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 43, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	82	Unlike original patent claim 44, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 44, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	82	Unlike original patent claim 45, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 45, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	82	Unlike original patent claim 46, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 46, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	82	Unlike original patent claim 47, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 47, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	82	Unlike original patent claim 48, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 48, presented reissue claim 82 does not recite the language "quantitative measurement."
49	82	Unlike original patent claim 49, presented reissue claim 82 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 49, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	82	Unlike original patent claim 50, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 50, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	82	Unlike original patent claim 51, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 51, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	82	Unlike original patent claim 52, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 52, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	82	Unlike original patent claim 53, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 53, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	82	Unlike original patent claim 54, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 54, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	82	Unlike original patent claim 55, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 55, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	82	Unlike original patent claim 56, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 56, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	82	Unlike original patent claim 57, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 57, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	82	Unlike original patent claim 58, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 58, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	82	Unlike original patent claim 59, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 59, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "a porous mixed ionic-electronic conductive reference electrode having both an electronic conducting material and an ionic conducting material" and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	82	Unlike original patent claim 60, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 60, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	82	Unlike original patent claim 61, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 61, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	82	Unlike original patent claim 62, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 62, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	82	Unlike original patent claim 63, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 63, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	82	Unlike original patent claim 64, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 64, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
65	82	Unlike original patent claim 65, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 65, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	82	Unlike original patent claim 66, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 66, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	82	Unlike original patent claim 67, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 67, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	82	Unlike original patent claim 68, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 68, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	82	Unlike original patent claim 69, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 69, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	82	Unlike original patent claim 70, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 70, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	82	Unlike original patent claim 71, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 71, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	82	Unlike original patent claim 72, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 72, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	82	Unlike original patent claim 73, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 73, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	82	Unlike original patent claim 74, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 74, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	82	Unlike original patent claim 75, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 75, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	82	Unlike original patent claim 76, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 76, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	82	Unlike original patent claim 77, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike original patent claim 77, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	82	Unlike original patent claim 78, presented reissue claim 82 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means." Unlike, original patent claim 78, presented reissue claim 82 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	83	Unlike original patent claim 1, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 1, presented reissue claim 83 does not recite the language "quantitative measurement."
2	83	Unlike original patent claim 2, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 2, presented reissue claim 83 does not recite the language "quantitative measurement," does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."
3	83	Unlike original patent claim 3, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 3, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	83	Unlike original patent claim 4, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 4, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	83	Unlike original patent claim 5, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 5, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
6	83	Unlike original patent claim 6, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 6, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	83	Unlike original patent claim 7, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 7, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	83	Unlike original patent claim 8, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 8, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	83	Unlike original patent claim 9, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 9, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	83	Unlike original patent claim 10, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 10, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	83	Unlike original patent claim 11, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 11, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	83	Unlike original patent claim 12, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 12, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	83	Unlike original patent claim 13, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 13, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	83	Unlike original patent claim 14, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 14, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	83	Unlike original patent claim 15, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 15, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	83	Unlike original patent claim 16, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, " and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 16, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	83	Unlike original patent claim 17, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 17, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	83	Unlike original patent claim 18, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 18, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	83	Unlike original patent claim 19, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 19, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	83	Unlike original patent claim 20, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 20, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	83	Unlike original patent claim 21, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 21, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	83	Unlike original patent claim 22, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 22, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	83	Unlike original patent claim 23, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 23, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	83	Unlike original patent claim 24, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 24, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	83	Unlike original patent claim 25, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 25, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	83	Unlike original patent claim 26, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 26, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	83	Unlike original patent claim 27, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 27, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes.
28	83	Unlike original patent claim 28, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 28, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	83	Unlike original patent claim 29, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 29, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	83	Unlike original patent claim 30, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 30, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "said sensing and counter electrodes having electrically connected therebetween said means for electrical measurement; means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	83	Unlike original patent claim 31, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 31, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	83	Unlike original patent claim 32, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 32, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	83	Unlike original patent claim 33, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 33, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	83	Unlike original patent claim 34, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 34, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	83	Unlike original patent claim 35, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 35, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	83	Unlike original patent claim 36, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 36, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	83	Unlike original patent claim 37, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 37, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "rein the electrochemical gas sensor is adapted to detect hydrogen."
38	83	Unlike original patent claim 38, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 38, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	83	Unlike original patent claim 39, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 39, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	83	Unlike original patent claim 40, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 40, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	83	Unlike original patent claim 41, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 41, presented reissue claim 83 does not recite the language "quantitative measurement."
42	83	Unlike original patent claim 42, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 42, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	83	Unlike original patent claim 43, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 43, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	83	Unlike original patent claim 44, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 44, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	83	Unlike original patent claim 45, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 45, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	83	Unlike original patent claim 46, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 46, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	83	Unlike original patent claim 47, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 47, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	83	Unlike original patent claim 48, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 48, presented reissue claim 83 does not recite the language "quantitative measurement."
49	83	Unlike original patent claim 49, presented reissue claim 83 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 49, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	83	Unlike original patent claim 50, presented reissue claim 83 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm,” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means,” and also recites the language “in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike, original patent claim 50, presented reissue claim 83 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials.”
51	83	Unlike original patent claim 51, presented reissue claim 83 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm,” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means,” and also recites the language “in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike original patent claim 51, presented reissue claim 83 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	83	Unlike original patent claim 52, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 52, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	83	Unlike original patent claim 53, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 53, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	83	Unlike original patent claim 54, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 54, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	83	Unlike original patent claim 55, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 55, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	83	Unlike original patent claim 56, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 56, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	83	Unlike original patent claim 57, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 57, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	83	Unlike original patent claim 58, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 58, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	83	Unlike original patent claim 59, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 59, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "a porous mixed ionic-electronic conductive reference electrode having both an electronic conducting material and an ionic conducting material" and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	83	Unlike original patent claim 60, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 60, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	83	Unlike original patent claim 61, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 61, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	83	Unlike original patent claim 62, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 62, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	83	Unlike original patent claim 63, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 63, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	83	Unlike original patent claim 64, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 64, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
65	83	Unlike original patent claim 65, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 65, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	83	Unlike original patent claim 66, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means, and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 66, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	83	Unlike original patent claim 67, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 67, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	83	Unlike original patent claim 68, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 68, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	83	Unlike original patent claim 69, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 69, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	83	Unlike original patent claim 70, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 70, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	83	Unlike original patent claim 71, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 71, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	83	Unlike original patent claim 72, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 72, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	83	Unlike original patent claim 73, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 73, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	83	Unlike original patent claim 74, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 74, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	83	Unlike original patent claim 75, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 75, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	83	Unlike original patent claim 76, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 76, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	83	Unlike original patent claim 77, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 77, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	83	Unlike original patent claim 78, presented reissue claim 83 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike, original patent claim 78, presented reissue claim 83 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	84	Unlike original patent claim 1, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 1, presented reissue claim 84 does not recite the language "quantitative measurement."
2	84	Unlike original patent claim 2, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 84 does not recite the language "quantitative measurement," does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."
3	84	Unlike original patent claim 3, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	84	Unlike original patent claim 4, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	84	Unlike original patent claim 5, presented reissue claim 84 recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 5, presented reissue claim 84 does not recite the language “quantitative measurement,” and also does not recite the language “wherein said sensing and counter electrodes comprise conductive metal oxides.”
6	84	Unlike original patent claim 6, presented reissue claim 84 recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 6, presented reissue claim 84 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	84	Unlike original patent claim 7, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	84	Unlike original patent claim 8, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	84	Unlike original patent claim 9, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	84	Unlike original patent claim 10, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	84	Unlike original patent claim 11, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	84	Unlike original patent claim 12, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	84	Unlike original patent claim 13, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	84	Unlike original patent claim 14, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	84	Unlike original patent claim 15, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	84	Unlike original patent claim 16, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	84	Unlike original patent claim 17, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	84	Unlike original patent claim 18, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, " and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	84	Unlike original patent claim 19, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 19, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	84	Unlike original patent claim 20, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 20, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	84	Unlike original patent claim 21, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	84	Unlike original patent claim 22, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	84	Unlike original patent claim 23, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	84	Unlike original patent claim 24, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	84	Unlike original patent claim 25, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	84	Unlike original patent claim 26, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	84	Unlike original patent claim 27, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, " and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes.
28	84	Unlike original patent claim 28, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, " and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	84	Unlike original patent claim 29, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	84	Unlike original patent claim 30, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 30, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "said sensing and counter electrodes having electrically connected therebetween said means for electrical measurement; means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	84	Unlike original patent claim 31, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 31, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	84	Unlike original patent claim 32, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means,," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 32, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	84	Unlike original patent claim 33, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 33, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	84	Unlike original patent claim 34, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 34, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	84	Unlike original patent claim 35, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 35, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	84	Unlike original patent claim 36, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 36, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	84	Unlike original patent claim 37, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 37, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "rein the electrochemical gas sensor is adapted to detect hydrogen."
38	84	Unlike original patent claim 38, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 38, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	84	Unlike original patent claim 39, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 39, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	84	Unlike original patent claim 40, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means" and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 40, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	84	Unlike original patent claim 41, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 41, presented reissue claim 84 does not recite the language "quantitative measurement."
42	84	Unlike original patent claim 42, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 42, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	84	Unlike original patent claim 43, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 43, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	84	Unlike original patent claim 44, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 44, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	84	Unlike original patent claim 45, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 45, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	84	Unlike original patent claim 46, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 46, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	84	Unlike original patent claim 47, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 47, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	84	Unlike original patent claim 48, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 48, presented reissue claim 84 does not recite the language "quantitative measurement."
49	84	Unlike original patent claim 49, presented reissue claim 84 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 49, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	84	Unlike original patent claim 50, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 50, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	84	Unlike original patent claim 51, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 51, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	84	Unlike original patent claim 52, presented reissue claim 84 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm,” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means,” and also recites the language “in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.” Unlike, original patent claim 52, presented reissue claim 84 does not recite the language “quantitative measurement,” and also does not recite the language “wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum.”
53	84	Unlike original patent claim 53, presented reissue claim 84 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm,” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means,” and also recites the language “in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 53, presented reissue claim 84 does not recite the language “quantitative measurement,” and also does not recite the language “wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	84	Unlike original patent claim 54, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 54, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	84	Unlike original patent claim 55, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 55, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	84	Unlike original patent claim 56, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 56, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	84	Unlike original patent claim 57, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 57, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	84	Unlike original patent claim 58, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 58, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	84	Unlike original patent claim 59, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 59, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "a porous mixed ionic-electronic conductive reference electrode having both an electronic conducting material and an ionic conducting material" and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	84	Unlike original patent claim 60, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 60, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	84	Unlike original patent claim 61, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 61, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	84	Unlike original patent claim 62, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 62, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	84	Unlike original patent claim 63, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 63, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	84	Unlike original patent claim 64, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 64, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
65	84	Unlike original patent claim 65, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 65, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	84	Unlike original patent claim 66, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 66, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	84	Unlike original patent claim 67, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 67, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	84	Unlike original patent claim 68, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 68, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	84	Unlike original patent claim 69, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 69, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	84	Unlike original patent claim 70, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 70, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	84	Unlike original patent claim 71, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 71, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	84	Unlike original patent claim 72, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 72, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	84	Unlike original patent claim 73, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 73, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	84	Unlike original patent claim 74, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 74, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	84	Unlike original patent claim 75, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 75, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	84	Unlike original patent claim 76, presented reissue claim 84 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm,” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means,” and also recites the language “in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.” Unlike, original patent claim 76, presented reissue claim 84 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes.”
77	84	Unlike original patent claim 77, presented reissue claim 84 recites the language “a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm,” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means,” and also recites the language “in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 77, presented reissue claim 84 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	84	Unlike original patent claim 78, presented reissue claim 84 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 78, presented reissue claim 84 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	85	Unlike original patent claim 1, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 1, presented reissue claim 85 does not recite the language "quantitative measurement."
2	85	Unlike original patent claim 2, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 85 does not recite the language "quantitative measurement," does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."
3	85	Unlike original patent claim 3, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	85	Unlike original patent claim 4, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	85	Unlike original patent claim 5, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides,"
6	85	Unlike original patent claim 6, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	85	Unlike original patent claim 7, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	85	Unlike original patent claim 8, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	85	Unlike original patent claim 9, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	85	Unlike original patent claim 10, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	85	Unlike original patent claim 11, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	85	Unlike original patent claim 12, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	85	Unlike original patent claim 13, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	85	Unlike original patent claim 14, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	85	Unlike original patent claim 15, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	85	Unlike original patent claim 16, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, " and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	85	Unlike original patent claim 17, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	85	Unlike original patent claim 18, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	85	Unlike original patent claim 19, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 19, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	85	Unlike original patent claim 20, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 20, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	85	Unlike original patent claim 21, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	85	Unlike original patent claim 22, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	85	Unlike original patent claim 23, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	85	Unlike original patent claim 24, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	85	Unlike original patent claim 25, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	85	Unlike original patent claim 26, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	85	Unlike original patent claim 27, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes.
28	85	Unlike original patent claim 28, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	85	Unlike original patent claim 29, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	85	Unlike original patent claim 30, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 30, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "said sensing and counter electrodes having electrically connected therebetween said means for electrical measurement; means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	85	Unlike original patent claim 31, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 31, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	85	Unlike original patent claim 32, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 32, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	85	Unlike original patent claim 33, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 33, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	85	Unlike original patent claim 34, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 34, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	85	Unlike original patent claim 35, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 35, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	85	Unlike original patent claim 36, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 36, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	85	Unlike original patent claim 37, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 37, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "rein the electrochemical gas sensor is adapted to detect hydrogen."
38	85	Unlike original patent claim 38, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 38, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	85	Unlike original patent claim 39, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 39, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	85	Unlike original patent claim 40, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 40, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	85	Unlike original patent claim 41, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 41, presented reissue claim 85 does not recite the language "quantitative measurement."
42	85	Unlike original patent claim 42, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 42, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	85	Unlike original patent claim 43, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 43, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	85	Unlike original patent claim 44, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 44, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	85	Unlike original patent claim 45, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 45, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	85	Unlike original patent claim 46, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 46, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	85	Unlike original patent claim 47, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 47, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	85	Unlike original patent claim 48, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 48, presented reissue claim 85 does not recite the language "quantitative measurement."
49	85	Unlike original patent claim 49, presented reissue claim 85 recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane, and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 49, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	85	Unlike original patent claim 50, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 50, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	85	Unlike original patent claim 51, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 51, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	85	Unlike original patent claim 52, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 52, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	85	Unlike original patent claim 53, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 53, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	85	Unlike original patent claim 54, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 54, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	85	Unlike original patent claim 55, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 55, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	85	Unlike original patent claim 56, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane;" and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 56, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	85	Unlike original patent claim 57, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 57, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	85	Unlike original patent claim 58, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 58, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	85	Unlike original patent claim 59, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 59, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "a porous mixed ionic-electronic conductive reference electrode having both an electronic conducting material and an ionic conducting material" and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	85	Unlike original patent claim 60, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 60, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	85	Unlike original patent claim 61, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 61, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	85	Unlike original patent claim 62, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 62, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	85	Unlike original patent claim 63, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 63, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	85	Unlike original patent claim 64, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 64, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
65	85	Unlike original patent claim 65, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 65, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	85	Unlike original patent claim 66, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means, and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 66, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	85	Unlike original patent claim 67, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane" and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 67, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	85	Unlike original patent claim 68, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 68, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	85	Unlike original patent claim 69, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 69, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	85	Unlike original patent claim 70, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 70, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	85	Unlike original patent claim 71, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 71, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	85	Unlike original patent claim 72, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 72, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	85	Unlike original patent claim 73, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 73, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	85	Unlike original patent claim 74, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 74, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	85	Unlike original patent claim 75, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 75, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	85	Unlike original patent claim 76, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 76, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	85	Unlike original patent claim 77, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 77, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	85	Unlike original patent claim 78, presented reissue claim 85 recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode." Unlike, original patent claim 78, presented reissue claim 85 does not recite the language "quantitative measurement," and also does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	86	Unlike original patent claim 1, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 1, original reissue claim 86 does not recite the language "quantitative measurement."
2	86	Unlike original patent claim 2, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 2, presented reissue claim 86 does not recite the language "quantitative measurement," does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
3	86	Unlike original patent claim 3, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 3, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	86	Unlike original patent claim 4, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 4, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	86	Unlike original patent claim 5, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 5, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
6	86	Unlike original patent claim 6, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 6, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	86	Unlike original patent claim 7, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 7, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	86	Unlike original patent claim 8, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 8, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	86	Unlike original patent claim 9, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 9, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	86	Unlike original patent claim 10, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 10, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	86	Unlike original patent claim 11, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 11, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	86	Unlike original patent claim 12, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 12, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	86	Unlike original patent claim 13, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 13, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	86	Unlike original patent claim 14, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 14, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	86	Unlike original patent claim 15, presented reissue claim 86 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 15, presented reissue claim 86 does not recite the language “quantitative measurement,” and does not recite the language “wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.”
16	86	Unlike original patent claim 16, presented reissue claim 86 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 16, presented reissue claim 86 does not recite the language “quantitative measurement,” and does not recite the language “wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	86	Unlike original patent claim 17, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 17, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	86	Unlike original patent claim 18, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 18, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	86	Unlike original patent claim 19, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 19, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	86	Unlike original patent claim 20, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 20, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	86	Unlike original patent claim 21, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 21, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	86	Unlike original patent claim 22, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 22, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	86	Unlike original patent claim 23, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 23, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	86	Unlike original patent claim 24, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 24, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	86	Unlike original patent claim 25, presented reissue claim 86 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 25, presented reissue claim 86 does not recite the language “quantitative measurement,” and does not recite the language “wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum.”
26	86	Unlike original patent claim 26, presented reissue claim 86 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 26, presented reissue claim 86 does not recite the language “quantitative measurement,” and does not recite the language “wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide.”

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	86	Unlike original patent claim 27, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 27, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes."
28	86	Unlike original patent claim 28, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 28, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	86	Unlike original patent claim 29, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 29, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	86	Unlike original patent claim 30, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 30, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	86	Unlike original patent claim 31, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 31, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	86	Unlike original patent claim 32, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 32, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	86	Unlike original patent claim 33, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 33, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	86	Unlike original patent claim 34, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 34, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	86	Unlike original patent claim 35, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 35, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	86	Unlike original patent claim 36, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 36, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	86	Unlike original patent claim 37, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 37, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."
38	86	Unlike original patent claim 38, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 38, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	86	Unlike original patent claim 39, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 39, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	86	Unlike original patent claim 40, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 40, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	86	Unlike original patent claim 41, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 41, original reissue claim 86 does not recite the language "quantitative measurement."
42	86	Unlike original patent claim 42, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 42, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	86	Unlike original patent claim 43, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 43, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	86	Unlike original patent claim 44, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 44, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	86	Unlike original patent claim 45, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 45, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	86	Unlike original patent claim 46, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 46, presented reissue claim 86 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	86	Unlike original patent claim 47, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 47, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	86	Unlike original patent claim 48, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 48, presented reissue claim 86 does not recite the language "quantitative measurement."
49	86	Unlike original patent claim 49, presented reissue claim 86 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 49, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	86	Unlike original patent claim 50, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 50, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	86	Unlike original patent claim 51, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 51, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	86	Unlike original patent claim 52, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 52, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	86	Unlike original patent claim 53, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 53, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	86	Unlike original patent claim 54, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 54, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	86	Unlike original patent claim 55, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 55, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	86	Unlike original patent claim 56, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 56, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	86	Unlike original patent claim 57, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 57, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	86	Unlike original patent claim 58, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 58, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	86	Unlike original patent claim 59, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 59, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	86	Unlike original patent claim 60, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 60, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	86	Unlike original patent claim 61, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 61, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	86	Unlike original patent claim 62, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 62, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	86	Unlike original patent claim 63, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 63, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	86	Unlike original patent claim 64, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 64, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
65	86	Unlike original patent claim 65, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 65, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	86	Unlike original patent claim 66, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 66, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	86	Unlike original patent claim 67, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 67, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	86	Unlike original patent claim 68, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 68, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	86	Unlike original patent claim 69, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 69, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	86	Unlike original patent claim 70, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 70, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	86	Unlike original patent claim 71, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 71, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	86	Unlike original patent claim 72, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 72, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	86	Unlike original patent claim 73, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 73, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	86	Unlike original patent claim 74, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 74, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	80	Unlike original patent claim 75, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 75, presented reissue claim 86 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	86	Unlike original patent claim 76, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 76, presented reissue claim 86 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	86	Unlike original patent claim 77, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 77, presented reissue claim 86 does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	86	Unlike original patent claim 78, presented reissue claim 86 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 78, presented reissue claim 86 does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	87	Unlike original patent claim 1, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 1, original reissue claim 87 does not recite the language "quantitative measurement."
2	87	Unlike original patent claim 2, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 2, presented reissue claim 87 does not recite the language "quantitative measurement," does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
3	87	Unlike original patent claim 3, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 3, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	87	Unlike original patent claim 4, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 4, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	87	Unlike original patent claim 5, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 5, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
6	87	Unlike original patent claim 6, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 6, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	87	Unlike original patent claim 7, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 7, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	87	Unlike original patent claim 8, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 8, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	87	Unlike original patent claim 9, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 9, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	87	Unlike original patent claim 10, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 10, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	87	Unlike original patent claim 11, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 11, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	87	Unlike original patent claim 12, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 12, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	87	Unlike original patent claim 13, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 13, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	87	Unlike original patent claim 14, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 14, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	87	Unlike original patent claim 15, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 15, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	87	Unlike original patent claim 16, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 16, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	87	Unlike original patent claim 17, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 17, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	87	Unlike original patent claim 18, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 18, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	87	Unlike original patent claim 19, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 19, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	87	Unlike original patent claim 20, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 20, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	87	Unlike original patent claim 21, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 21, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	87	Unlike original patent claim 22, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 22, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	87	Unlike original patent claim 23, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 23, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	87	Unlike original patent claim 24, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 24, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	87	Unlike original patent claim 25, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 25, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	87	Unlike original patent claim 26, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 26, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	87	Unlike original patent claim 27, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 27, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes."
28	87	Unlike original patent claim 28, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 28, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	87	Unlike original patent claim 29, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 29, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	87	Unlike original patent claim 30, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 30, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	87	Unlike original patent claim 31, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 31, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	87	Unlike original patent claim 32, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 32, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	87	Unlike original patent claim 33, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 33, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	87	Unlike original patent claim 34, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 34, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	87	Unlike original patent claim 35, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 35, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	87	Unlike original patent claim 36, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 36, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	87	Unlike original patent claim 37, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 37, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."
38	87	Unlike original patent claim 38, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 38, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	87	Unlike original patent claim 39, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 39, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	87	Unlike original patent claim 40, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 40, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	87	Unlike original patent claim 41, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 41, original reissue claim 87 does not recite the language "quantitative measurement."
42	87	Unlike original patent claim 42, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 42, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	87	Unlike original patent claim 43, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 43, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	87	Unlike original patent claim 44, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 44, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	87	Unlike original patent claim 45, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 45, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	87	Unlike original patent claim 46, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 46, presented reissue claim 87 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	87	Unlike original patent claim 47, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 47, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	87	Unlike original patent claim 48, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 48, presented reissue claim 87 does not recite the language "quantitative measurement."
49	87	Unlike original patent claim 49, presented reissue claim 87 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 49, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	87	Unlike original patent claim 50, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 50, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	87	Unlike original patent claim 51, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 51, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	87	Unlike original patent claim 52, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 52, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	87	Unlike original patent claim 53, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 53, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	87	Unlike original patent claim 54, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 54, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	87	Unlike original patent claim 55, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 55, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	87	Unlike original patent claim 56, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 56, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	87	Unlike original patent claim 57, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 57, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	87	Unlike original patent claim 58, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 58, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	87	Unlike original patent claim 59, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 59, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	87	Unlike original patent claim 60, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 60, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	87	Unlike original patent claim 61, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 61, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	87	Unlike original patent claim 62, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 62, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	87	Unlike original patent claim 63, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 63, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	87	Unlike original patent claim 64, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 64, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
65	87	Unlike original patent claim 65, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 65, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	87	Unlike original patent claim 66, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 66, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	87	Unlike original patent claim 67, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 67, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	87	Unlike original patent claim 68, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 68, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	87	Unlike original patent claim 69, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 69, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	87	Unlike original patent claim 70, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 70, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	87	Unlike original patent claim 71, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 71, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	87	Unlike original patent claim 72, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 72, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	87	Unlike original patent claim 73, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 73, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	87	Unlike original patent claim 74, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 74, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	87	Unlike original patent claim 75, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 75, presented reissue claim 87 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	87	Unlike original patent claim 76, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 76, presented reissue claim 87 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	87	Unlike original patent claim 77, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 77, presented reissue claim 87 does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	87	Unlike original patent claim 78, presented reissue claim 87 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 78, presented reissue claim 87 does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
1	88	Unlike original patent claim 1, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 1, original reissue claim 88 does not recite the language "quantitative measurement."
2	88	Unlike original patent claim 2, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 2, presented reissue claim 88 does not recite the language "quantitative measurement," does not recite the language "means for applying DC power across the protonic conductive electrolyte membrane; an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
3	88	Unlike original patent claim 3, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 3, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise carbon."
4	88	Unlike original patent claim 4, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 4, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
5	88	Unlike original patent claim 5, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 5, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
6	88	Unlike original patent claim 6, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 6, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
7	88	Unlike original patent claim 7, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 7, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
8	88	Unlike original patent claim 8, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 8, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
9	88	Unlike original patent claim 9, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 9, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
10	88	Unlike original patent claim 10, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 10, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
11	88	Unlike original patent claim 11, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 11, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
12	88	Unlike original patent claim 12, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 12, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
13	88	Unlike original patent claim 13, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 13, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
14	88	Unlike original patent claim 14, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 14, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
15	88	Unlike original patent claim 15, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 15, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
16	88	Unlike original patent claim 16, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 16, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
17	88	Unlike original patent claim 17, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 17, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."
18	88	Unlike original patent claim 18, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 18, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor further comprises: first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane; means for applying a DC power across the membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
19	88	Unlike original patent claim 19, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 19, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon."
20	88	Unlike original patent claim 20, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 20, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
21	88	Unlike original patent claim 21, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 21, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides."
22	88	Unlike original patent claim 22, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 22, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
23	88	Unlike original patent claim 23, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 23, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
24	88	Unlike original patent claim 24, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 24, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
25	88	Unlike original patent claim 25, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 25, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum."
26	88	Unlike original patent claim 26, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 26, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
27	88	Unlike original patent claim 27, presented reissue claim 88recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 27, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; means for applying a DC power across said second protonic electrolyte membrane; said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes."
28	88	Unlike original patent claim 28, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 28, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
29	88	Unlike original patent claim 29, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 29, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
30	88	Unlike original patent claim 30, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 30, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "means for applying a DC pulse power source across the membrane; said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane; whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
31	88	Unlike original patent claim 31, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 31, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise carbon."
32	88	Unlike original patent claim 32, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 32, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
33	88	Unlike original patent claim 33, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 33, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing and counter electrodes comprise conductive metal oxides."
34	88	Unlike original patent claim 34, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 34, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
35	88	Unlike original patent claim 35, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 35, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
36	88	Unlike original patent claim 36, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 36, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
37	88	Unlike original patent claim 37, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 37, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."
38	88	Unlike original patent claim 38, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 38, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
39	88	Unlike original patent claim 39, presented reissue claim 88recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 39, presented reissue claim 88does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."
40	88	Unlike original patent claim 40, presented reissue claim 88recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 40, presented reissue claim 88does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
41	88	Unlike original patent claim 41, presented reissue claim 88recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 41, original reissue claim 88does not recite the language "quantitative measurement."
42	88	Unlike original patent claim 42, presented reissue claim 88recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 42, presented reissue claim 88does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
43	88	Unlike original patent claim 43, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 43, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
44	88	Unlike original patent claim 44, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 44, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
45	88	Unlike original patent claim 45, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 45, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
46	88	Unlike original patent claim 46, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 46, presented reissue claim 88 does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
47	88	Unlike original patent claim 47, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 47, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "a second protonic conductive electrolyte membrane; first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane; said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere; said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure; means for electrical measurement in electrical contact with said sensing electrode and perforated support structure; means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
48	88	Unlike original patent claim 48, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 48, presented reissue claim 88 does not recite the language "quantitative measurement."
49	88	Unlike original patent claim 49, presented reissue claim 88 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 49, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
50	88	Unlike original patent claim 50, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 50, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials."
51	88	Unlike original patent claim 51, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 51, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
52	88	Unlike original patent claim 52, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 52, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."
53	88	Unlike original patent claim 53, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 53, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
54	88	Unlike original patent claim 54, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 54, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."
55	88	Unlike original patent claim 55, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 55, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
56	88	Unlike original patent claim 56, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 56, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
57	88	Unlike original patent claim 57, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 57, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
58	88	Unlike original patent claim 58, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm," also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 58, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
59	88	Unlike original patent claim 59, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 59, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode; means for electrical measurement in electrical contact between the sensing electrode and the counter electrode; means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode; whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane; and whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
60	88	Unlike original patent claim 60, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 60, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, count and reference electrodes comprise carbon."
61	88	Unlike original patent claim 61, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 61, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, count and reference electrodes comprise noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
62	88	Unlike original patent claim 62, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 62, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein said sensing, counter and reference electrodes comprise conductive metal oxides."
63	88	Unlike original patent claim 63, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 63, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
64	88	Unlike original patent claim 64, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 64, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane."
65	88	Unlike original patent claim 65, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 65, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect CO."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
66	88	Unlike original patent claim 66, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 66, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect NO_x."
67	88	Unlike original patent claim 67, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 67, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect hydrogen."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
68	88	Unlike original patent claim 68, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 68, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2S."
69	88	Unlike original patent claim 69, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 69, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electrochemical gas sensor is adapted to detect H_2O vapor."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
70	88	Unlike original patent claim 70, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 70, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm."
71	88	Unlike original patent claim 71, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 71, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
72	88	Unlike original patent claim 72, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 72, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
73	88	Unlike original patent claim 73, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 73, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
74	88	Unlike original patent claim 74, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 74, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide."
75	88	Unlike original patent claim 75, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 75, presented reissue claim 88 does not recite the language "quantitative measurement," and does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
76	88	Unlike original patent claim 76, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 76, presented reissue claim 88 does not recite the language "wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes."
77	88	Unlike original patent claim 77, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 77, presented reissue claim 88 does not recite the language "wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in the Claim Language
78	88	Unlike original patent claim 78, presented reissue claim 88 recites the language a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm", also recites the language "said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 78, presented reissue claim 88 does not recite the language "wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes."

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee:	**Shen et al.**		
Assignee:	**Atwood Mobile Products, Inc.**		
U.S. Patent No.:	**5,573,648**	**Date Issued:**	**November 12, 1996**
Application No.:	**381,718**	**Date Filed:**	**January 31, 1995**
Title:	**GAS SENSOR BASED ON PROTONIC CONDUCTIVE MEMBRANES**		

****

Mail Stop Reissue
Commissioner for Patents
P.O. Box. 1450
Alexandria, VA 22313-1450

REISSUE APPLICATION: CONSENT OF ASSIGNEE; STATEMENT OF NON-ASSIGNMENT

Dear Sir:

This paper is being filed as part of the application for reissue patent based on the original patent captioned above.

Filed herewith this paper is a Certificate under 37 C.F.R. § 3.73(b).

The assignee owning an undivided interest in said original patent is Atwood Mobile Products, Inc. As shown in the attachments to the Certificate under 3.73(b), Atwood Industries, Inc. made a capital contribution of all its assets to Atwood RV Products, Inc. Atwood RV Products, Inc. merged with two other companies and subsequently changed its name to Atwood Mobile Products, Inc. Dura Automotive Systems, Inc. is authorized to act on behalf of the assignee. The assignee hereby consents to the accompanying application for reissue.

Dated: 7 July 2003

David Bovee
Vice President
Dura Automotive Systems, Inc.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee:	**Shen et al.**		
Assignee:	**Atwood Mobile Products, Inc.**		
U.S. Patent No.:	**5,573,648**	**Date Issued:**	**November 12, 1996**
Application No.:	**381,718**	**Date Filed:**	**January 31, 1995**

Title: **GAS SENSOR BASED ON PROTONIC CONDUCTIVE MEMBRANES**

****

Mail Stop Reissue
Commissioner for Patents
P.O. Box. 1450
Alexandria, VA 22313-1450

CERTIFICATE UNDER 37 C.F.R. § 3.73(b)

Dear Sir:

Atwood Mobile Products, Inc., the owner of all right, title and interest to the above-referenced patent, states that it is:

The assignee of the entire, right, title and interest in the patent identified above by virtue of:

~~(1) An Assignment from the inventors of the patent application/patent identified~~ above to Atwood Industries, Inc. The assignment was duly recorded in the United States Patent and Trademark Office at Reel 007454, Frame 0737 on January 31, 1995; and

(2) The documents attached to this Certificate show that Atwood Industries, Inc. made a capital contribution of all its assets to Atwood RV Products, Inc. The documents attached to this Certificate also show that Atwood RV Products, Inc., through a merger and name change, became Atwood Mobile Products, Inc.

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

7 July 2003
Date

David Bovee
Vice President
Dura Automotive Systems, Inc.

ATWOOD INDUSTRIES, INC.

WRITTEN CONSENT
IN LIEU OF A SPECIAL MEETING
OF THE BOARD OF DIRECTORS

The undersigned, being all the directors of Atwood Industries, Inc., an Illinois corporation (the "Corporation"), pursuant to Section 8.45 of the Illinois Business Corporation Act, hereby consent to the adoption of the following resolutions:

Authorization of Capital Contribution to Atwood RV Products, Inc.

WHEREAS, the mobile products business of the Corporation and its affiliates is being reorganized to transfer all related assets into a newly formed corporation called "Atwood RV Products, Inc.", which will be wholly owned by the Corporation;

WHEREAS, the Corporation has received from its parent company, Anderson Industries, Inc., a capital contribution in the form of all real property, buildings, machinery and equipment and inventory located at the Belvedere, Indiana and LaGrange, Indiana facilities;

WHEREAS, the Corporation wishes to transfer such mobile products assets and operations, together with all real property, buildings, machinery and equipment, and equipment located at the Rockford, Illinois, Greenbrier, Tennessee, and Elkhart, Indiana facilities, to its wholly-owned subsidiary, Atwood RV Products, Inc., as a capital contribution;

NOW THEREFORE, BE IT RESOLVED, that the Corporation hereby authorizes a capital contribution to be made to its wholly owned subsidiary, Atwood RV Products, Inc., such capital contribution to be made in the form of all real property, buildings, machinery and equipment and inventory located at the Belvedere, Indiana, LaGrange, Indiana, Rockford, Illinois, Greenbrier, Tennessee and Elkhart, Indiana facilities.

FURTHER RESOLVED, that the President, any Vice President, the Secretary, or any Assistant Secretary (the "Proper Officers") are hereby authorized and directed to take all such further actions and execute and deliver such further documents and instruments as may be necessary or appropriate in order to effectuate the foregoing capital contribution.

IN WITNESS WHEREOF, the undersigned have executed this Consent as of the date set forth below.

David R. Bovee

Stephen E.K. Graham

Dated: December 16, 1999

BLOOMFIELD 14707-A 214609

** TOTAL PAGE.05 **

Form **BCA-11.25**
(Rev. Jan. 1999)

ARTICLES OF MERGER CONSOLIDATION OR EXCHANGE

File # 6080-419-2

SUBMIT IN DUPLICATE

Jesse White
Secretary of State
Department of Business Services
Springfield, IL 62756
Telephone (217) 782-6961
http://www.sos.state.il.us

DO NOT SEND CASH!
Remit payment in check or money order, payable to "Secretary of State."
Filing Fee is $100, but if merger or consolidation involves more than 2 corporations, $50 for each additional corporation.

FILED
DEC 23 1999
JESSE WHITE
SECRETARY OF STATE

This space for use by Secretary of State
Date 12/23/99
Filing Fee $ 150.00
Approved:

1. Names of the corporations proposing to merge ~~consolidate~~ ~~exchange shares~~, and the state or country of their incorporation:

Name of Corporation	State or Country of Incorporation	Corporation File Number
Atwood RV Products, Inc.	Illinois	6080-419-2
Thompson I.G. Corp.	Michigan	NQ
Hydro Flame Corporation	Utah	NQ

2. The laws of the state or country under which each corporation is incorporated permits such merger, consolidation or exchange.

3. (a) Name of the surviving ~~new~~ ~~acquiring~~ corporation: Atwood RV Products, Inc.

(b) it shall be governed by the laws of: Illinois

If not sufficient space to cover this point, add one or more sheets of this size.

4. Plan of merger ~~consolidation~~ ~~exchange~~ is as follows: See Exhibit A attached.

EXPEDITED
DEC 23 1999
SECRETARY OF STATE

5. Plan of merger ~~consolidation~~ ~~exchange~~ was approved, as to each corporation not organized in Illinois, in compliance with the laws of the state under which it is organized, and (b) as to each Illinois corporation, as follows:

(The following items are not applicable to mergers under §11.30 — 90% owned subsidiary provisions. See Article 7.)

(Only "X" one box for each Illinois corporation)

Name of Corporation	By the shareholders, a resolution of the board of directors having been duly adopted and submitted to a vote at a meeting of shareholders. Not less than the minimum number of votes required by statute and by the articles of incorporation voted in favor of the action taken. (§ 11.20)	By written consent of the shareholders having not less than the minimum number of votes required by statute and by the articles of incorporation. Shareholders who have not consented in writing have been given notice in accordance with § 7.10 (§ 11.220)	By written consent of ALL the shareholders entitled to vote on the action, in accordance with § 7.10 & § 11.20
Atwood RV Products, Inc.	☐	☐	☒
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

6. *(Not applicable if surviving, new or acquiring corporation is an Illinois corporation)*

It is agreed that, upon and after the issuance of a certificate of merger, consolidation or exchange by the Secretary of State of the State of Illinois:

a. The surviving, new or acquiring corporation may be served with process in the State of Illinois in any proceeding for the enforcement of any obligation of any corporation organized under the laws of the State of Illinois which is a party to the merger, consolidation or exchange and in any proceeding for the enforcement of the rights of a dissenting shareholder of any such corporation organized under the laws of the State of Illinois against the surviving, new or acquiring corporation.

b. The Secretary of State of the State of Illinois shall be and hereby is irrevocably appointed as the agent of the surviving, new or acquiring corporation to accept service of process in any such proceedings, and

c. The surviving, new, or acquiring corporation will promptly pay to the dissenting shareholders of any corporation organized under the laws of the State of Illinois which is a party to the merger, consolidation or exchange the amount, if any, to which they shall be entitled under the provisions of "The Business Corporation Act of 1983" of the State of Illinois with respect to the rights of dissenting shareholders.

7. (Complete this item if reporting a merger under § 11.30—90% owned subsidiary provisions.) N/A

a. The number of outstanding shares of each class of each merging subsidiary corporation and the number of such shares of each class owned immediately prior to the adoption of the plan of merger by the parent corporation, are:

Name of Corporation	Total Number of Shares Outstanding of Each Class	Number of Shares of Each Class Owned Immediately Prior to Merger by the Parent Corporation

b. (Not applicable to 100% owned subsidaries)
The date of mailing a copy of the plan of merger and notice of the right to dissent to the shareholders of each merging subsidiary corporation was ______________, ________.
(Month & Day) (Year)

Was written consent for the merger or written waiver of the 30-day period by the holders of all the outstanding shares of all subsidiary corporations received? ☐ Yes ☐ No

(If the answer is "No," the duplicate copies of the Articles of Merger may not be delivered to the Secretary of State until after 30 days following the mailing of a copy of the plan of merger and of the notice of the right to dissent to the shareholders of each merging subsidiary corporation.)

8. The undersigned corporations have caused these articles to be signed by their duly authorized officers, each of whom affirms, under penalties of perjury, that the facts stated herein are true. (All signatures must be in BLACK INK.)

Dated December 16, 1999
(Month & Day) (Year)

attested by [signature]
(Signature of Secretary or Assistant Secretary)

J. Bryan Williams, Secretary
(Type or Print Name and Title)

Atwood RV Products, Inc.
(Exact Name of Corporation)

by [signature]
(Signature of President or Vice President)

David R. Bovee, President
(Type or Print Name and Title)

Dated December 16, 1999
(Month & Day) (Year)

attested by [signature]
(Signature of Secretary or Assistant Secretary)

John A. Krsul, Jr., Secretary
(Type or Print Name and Title)

Thompson I.G. Corp.
(Exact Name of Corporation)

by [signature]
(Signature of President or Vice President)

David R. Bovee, President
(Type or Print Name and Title)

Dated December 16, 1999
(Month & Day) (Year)

attested by [signature]
(Signature of Secretary or Assistant Secretary)

John A. Krsul, Jr., Secretary
(Type or Print Name and Title)

Hydro Flame Corporation
(Exact Name of Corporation)

by [signature]
(Signature of President or Vice President)

David R. Bovee, President
(Type or Print Name and Title)

00740958

6223/0011 37 001 Page 1 of 4
2000-09-22 11:01:10
Cook County Recorder 27.50

Form **BCA-10.30**
(Rev. Jan. 1999)

ARTICLES OF AMENDMENT

File #

SUBMIT

00740958

Jesse White
Secretary of State
Department of Business Services
Springfield, IL 62756
Telephone (217) 782-1832

Remit payment in check or money order, payable to "Secretary of State."

The filing fee for restated articles of amendment - $100.00

http://www.sos.state.il.us

FILED
AUG 25 2000
JESSE WHITE
SECRETARY OF STATE

This space for use by Secretary of State

Date 8-25-00
Franchise Tax $
Filing Fee* $25.00
Penalty $
Approved:

1. CORPORATE NAME: Atwood RV Products, Inc.

(Note 1)

2. MANNER OF ADOPTION OF AMENDMENT:

The following amendment of the Articles of Incorporation was adopted on August 15 (Month & Day) 2000 (Year) in the manner indicated below. ("X" one box only)

☐ By a majority of the incorporators, provided no directors were named in the articles of incorporation and no directors have been elected;

(Note 2)

☐ By a majority of the board of directors, in accordance with Section 10.10, the corporation having issued no shares as of the time of adoption of this amendment;

(Note 2)

☐ By a majority of the board of directors, in accordance with Section 10.15, shares having been issued but shareholder action not being required for the adoption of the amendment;

(Note 3)

☒ By the shareholders, in accordance with Section 10.20, a resolution of the board of directors having been duly adopted and submitted to the shareholders. At a meeting of shareholders, not less than the minimum number of votes required by statute and by the articles of incorporation were voted in favor of the amendment;

(Note 4)

☐ By the shareholders, in accordance with Sections 10.20 and 7.10, a resolution of the board of directors having been duly adopted and submitted to the shareholders. A consent in writing has been signed by shareholders having not less than the minimum number of votes required by statute and by the articles of incorporation. Shareholders who have not consented in writing have been given notice in accordance with Section 7.10;

(Notes 4 & 5)

☐ By the shareholders, in accordance with Sections 10.20 and 7.10, a resolution of the board of directors having been duly adopted and submitted to the shareholders. A consent in writing has been signed by all the shareholders entitled to vote on this amendment.

3. TEXT OF AMENDMENT: (Note 5)

a. When amendment effects a name change, insert the new corporate name below. Use Page 2 for all other amendments.

Article I: The name of the corporation is:

Atwood Mobile Products, Inc.
(NEW NAME)

All changes other than name, include on page 2
(over)

Text of Amendment

b. *(If amendment affects the corporate purpose, the amended purpose is required to be set forth in its entirety. If there is not sufficient space to do so, add one or more sheets of this size.)*

4. The manner, if not set forth in Article 3b, in which any exchange, reclassification or cancellation of issued shares, or a reduction of the number of authorized shares of any class below the number of issued shares of that class, provided for or effected by this amendment, is as follows: *(If not applicable, insert "No change")*

No change

5. (a) The manner, if not set forth in Article 3b, in which said amendment effects a change in the amount of paid-in capital (Paid-in capital replaces the terms Stated Capital and Paid-in Surplus and is equal to the total of these accounts) is as follows: *(If not applicable, insert "No change")*

No change

(b) The amount of paid-in capital (Paid-in Capital replaces the terms Stated Capital and Paid-in Surplus and is equal to the total of these accounts) as changed by this amendment is as follows: *(If not applicable, insert "No change")*

No change

	Before Amendment	After Amendment
Paid-in Capital	$ ________	$ ________

(Complete either Item 6 or 7 below. All signatures must be in BLACK INK.)

6. The undersigned corporation has caused this statement to be signed by its duly authorized officers, each of whom affirms, under penalties of perjury, that the facts stated herein are true.

Dated August 16 , 2000
(Month & Day) *(Year)*

attested by [signature]
(Signature of Secretary or Assistant Secretary)
J. Bryan Williams, Secretary
(Type or Print Name and Title)

Atwood RV Products, Inc.
(Exact Name of Corporation at date of execution)
by [signature]
(Signature of President or Vice President)
David R. Bovee, President
(Type or Print Name and Title)

7. If amendment is authorized pursuant to Section 10.10 by the incorporators, the incorporators must sign below, and type or print name and title.

OR

If amendment is authorized by the directors pursuant to Section 10.10 and there are no officers, then a majority of the directors or such directors as may be designated by the board, must sign below, and type or print name and title.

The undersigned affirms, under the penalties of perjury, that the facts stated herein are true.

Dated ____________________ , ________
(Month & Day) *(Year)*

NOTES and INSTRUCTIONS

NOTE 1: State the true exact corporate name as it appears on the records of the office of the Secretary of State, BEFORE any amendments herein reported.

NOTE 2: Incorporators are permitted to adopt amendments ONLY before any shares have been issued and before any directors have been named or elected. (§ 10.10)

NOTE 3: Directors may adopt amendments without shareholder approval in only seven instances, as follows:

- (a) to remove the names and addresses of directors named in the articles of incorporation;
- (b) to remove the name and address of the initial registered agent and registered office, provided a statement pursuant to § 5.10 is also filed;
- (c) to increase, decrease, create or eliminate the par value of the shares of any class, so long as no class or series of shares is adversely affected.
- (d) to split the issued whole shares and unissued authorized shares by multiplying them by a whole number, so long as no class or series is adversely affected thereby;
- (e) to change the corporate name by substituting the word "corporation", "incorporated", "company", "limited", or the abbreviation "corp.", "inc.", "co.", or "ltd." for a similar word or abbreviation in the name, or by adding a geographical attribution to the name;
- (f) to reduce the authorized shares of any class pursuant to a cancellation statement filed in accordance with § 9.05,
- (g) to restate the articles of incorporation as currently amended. (§ 10.15)

NOTE 4: All amendments not adopted under § 10.10 or § 10.15 require (1) that the board of directors adopt a resolution setting forth the proposed amendment and (2) that the shareholders approve the amendment.

Shareholder approval may be (1) by vote at a shareholders' meeting *(either annual or special)* or (2) by consent, in writing, without a meeting.

To be adopted, the amendment must receive the affirmative vote or consent of the holders of at least 2/3 of the outstanding shares entitled to vote on the amendment *(but if class voting applies, then also at least a 2/3 vote within each class is required).*

The articles of incorporation may supersede the 2/3 vote requirement by specifying any smaller or larger vote requirement not less than a majority of the outstanding shares entitled to vote and not less than a majority within each class when class voting applies. (§ 10.20)

NOTE 5: When shareholder approval is by consent, all shareholders must be given notice of the proposed amendment at least 5 days before the consent is signed. If the amendment is adopted, shareholders who have not signed the consent must be promptly notified of the passage of the amendment. (§§ 7.10 & 10.20)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee:	**Shen et al.**		
Assignee:	**Atwood Industries, Inc.**		
U.S. Patent No.:	**5,573,648**	**Date Issued:**	**November 12, 1996**
Application No.:	**381,718**	**Date Filed:**	**January 31, 1995**

Title: GAS SENSOR BASED ON PROTONIC CONDUCTIVE MEMBRANES

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Mail Stop Reissue
Commissioner for Patents
P.O. Box. 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT for
REISSUE OF U.S. PATENT No. 5,573,648

Dear Sir:

This preliminary amendment is filed herewith a request for reissue application of US Patent No. 5,573,648, a reissue application declaration by the assignee, a statement under 37 C.F.R. 3.73(b), a copy of the specification, figures, abstract and claims and a statement under 37 C.F.R. 1.178(b). Prior to examining the reissue application, please enter the following amendments and remarks. A listing of all claims is provided below for convenient reference.

--THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK--

AMENDMENTS TO THE CLAIMS

1. (Original) An electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode;

means for electrical measurement;

said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

2. (Original) The electrochemical gas sensor as defined in claim 1, further comprising:

means for applying DC power across the protonic conductive electrolyte membrane;

an electrical connection between the sensing electrode, the counter electrode, and the means for applying DC power across the protonic conductive electrolyte membrane; and

switch means for alternating an electrical connection between the sensing electrode and counter electrode from the electrical measurement means to the means for applying DC power across the protonic conductive electrolyte membrane;

whereby the gas is transported away from the counter electrode when the means for applying DC power across the protonic conductive electrolyte membrane applies a DC power to the sensing and counter electrodes.

3. (Original) The electrochemical gas sensor as defined in claim 1, wherein said sensing and counter electrodes comprise carbon.

4. (Original) The electrochemical gas sensor as defined in claim 1, wherein said sensing and counter electrodes comprise noble metals.

5. (Original) The electrochemical gas sensor as defined in claim 1, wherein said sensing and counter electrodes comprise conductive metal oxides.

6. (Original) The electrochemical gas sensor as defined in claim 1, wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.

7. (Original) The electrochemical gas sensor as defined in claim 1, wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane.

8. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electrochemical gas sensor is adapted to detect CO.

9. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electrochemical gas sensor is adapted to detect NO_x.

10. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electrochemical gas sensor is adapted to detect hydrogen.

11. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electrochemical gas sensor is adapted to detect H_2S.

12. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electrochemical gas sensor is adapted to detect H_2O vapor.

13. (Original) The electrochemical gas sensor as defined in claim 1, wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm.

14. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials.

15. (Original) The electrochemical gas sensor as defined in claim 14, wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

16. (Original) The electrochemical gas sensor as defined in claim 14, wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum.

17. (Original) The electrochemical gas sensor as defined in claim 14, wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide.

18. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electrochemical gas sensor further comprises:

first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conductive material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said protonic conductive electrolyte membrane;

means for applying a DC power across the membrane;

said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the membrane;

whereby the gas is transported away from the counter electrode when said means for applying DC power across the membrane applies a DC power to the first and second pump electrodes.

19. (Original) The electrochemical gas sensor of claim 18, wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise carbon.

20. (Original) The electrochemical gas sensor as defined in claim 18, wherein the

electronic and ionic conducting materials of the first and second pumping electrodes comprise noble metals.

21. (Original) The electrochemical gas sensor as defined in claim 18, wherein the electronic and ionic conducting materials of the first and second pumping electrodes comprise conductive metal oxides.

22. (Original) The electrochemical gas sensor as defined in claim 18, wherein the first and second pumping electrodes have a diameter of about 10 mm, and the first protonic conductive electrolyte membrane has a thickness of about 0.17 mm.

23. (Original) The electrochemical gas sensor as defined in claim 18, wherein the electronic and ionic conducting materials of said first and second pumping electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials.

24. (Original) The electrochemical gas sensor as defined in claim 23, wherein the proton conductor material for both the first and second pumping electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

25. (Original) The electrochemical gas sensor as defined in claim 23, wherein one of the first and second electrical conductor materials for the first pumping electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the first pumping electrode is 10 to 50 wt% of platinum.

26. (Original) The electrochemical gas sensor as defined in claim 23, wherein one of the first and second electrical conductor materials for the second pumping electrode is 50-99

wt% of carbon black, and the other of the first and second electrical conductor materials for the second pumping electrode is 10 to 50 wt% of Ru oxide.

27. (Original) The electrochemical gas sensor as defined in claim 1, wherein the electrochemical gas sensor further comprises:

a second protonic conductive electrolyte membrane;

first and second porous mixed ionic-electronic conductive pump electrodes each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane;

means for applying a DC power across said second protonic electrolyte membrane;

said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when said means for applying DC power across said second protonic electrolyte membrane applies a DC power to the first and second pump electrodes.

28. (Original) The electrochemical gas sensor as defined in claim 27, wherein the second protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.

29. (Original)The electrochemical gas sensor as defined in claim 27, wherein the second protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane.

30. (Original) An electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode;

means for electrical measurement;

said sensing and counter electrodes having electrically connected therebetween said means for electrical measurement;

means for applying a DC pulse power source across the membrane;

said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the membrane; and

switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the means for applying a DC pulse power source across the membrane;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said means for applying a DC pulse power source across the membrane moves CO away from a side of the gas sensor where the counter electrode is placed when said switch means connects said means for applying a DC pulse power source across the membrane to the sensing and counter electrodes.

31. (Original) The electrochemical gas sensor as defined in claim 30, wherein said sensing and counter electrodes comprise carbon.

32. (Original) The electrochemical gas sensor as defined in claim 30, wherein said sensing and counter electrodes comprise noble metals.

33. (Original) The electrochemical gas sensor as defined in claim 30, wherein said sensing and counter electrodes comprise conductive metal oxides.

34. (Original) The electrochemical gas sensor as defined in claim 30, wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.

35. (Original) The electrochemical gas sensor as defined in claim 30, wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane.

36. (Original) The electrochemical gas sensor as defined in claim 30, wherein the electrochemical gas sensor is adapted to detect CO.

37. (Original) The electrochemical gas sensor as defined in claim 30, wherein the electrochemical gas sensor is adapted to detect hydrogen.

38. (Original) The electrochemical gas sensor as defined in claim 30, wherein the electrochemical gas sensor is adapted to detect H_2S.

39. (Original) The electrochemical gas sensor as defined in claim 30, wherein the electrochemical gas sensor is adapted to detect H_2O vapor.

40. (Original) The electrochemical gas sensor as defined in claim 30, wherein the electrochemical gas sensor is adapted to detect NO_x.

41. (Original) The electrochemical gas sensor as defined in claim 30, wherein the sensing and counter electrodes have a diameter in a range of 1 mm to 15 mm, and the protonic conductive electrolyte membrane has a thickness in a range of 0.1 mm-1 mm.

42. (Original) The electrochemical gas sensor as defined in claim 41, wherein the sensing and counter electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm.

43. (Original) The electrochemical gas sensor as defined in claim 30, wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials.

44. (Original) The electrochemical gas sensor as defined in claim 43, wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

45. (Original) The electrochemical gas sensor as defined in claim 43, wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum.

46. (Original) The electrochemical gas sensor as defined in claim 43, wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter electrode is 1-50 wt% of Ru oxide.

47. (Original) An electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material and being exposed to the ambient atmosphere;

a porous mixed ionic-conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode;

a second protonic conductive electrolyte membrane;

first and second porous mixed ionic-electronic conductive pump electrodes, each having both an electronic conductive material and an ionic conducting material, each of said first and second pump electrodes being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane;

said first porous pump electrode being exposed to a chamber sealed off from the ambient atmosphere;

said second porous pump electrode being separated from said counter electrode by a perforated support structure composed of an electrical conducting material, both said second porous pump electrode and said counter electrode being in contact with said perforated support structure;

means for electrical measurement in electrical contact with said sensing electrode and perforated support structure;

means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first pump electrode and said perforated support structure; whereby the gas is transported away from the counter electrode when the means for applying a DC power across said second protonic electrolyte membrane applies a DC power across said second protonic electrolyte membrane; and
whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

48. (Original) The electrochemical gas sensor as defined in claim 47, wherein the sensing and counter electrodes have a diameter in a range of 1 mm-15 mm, and the protonic conductive electrolyte membrane has a thickness in a range of 0.1 mm-1 mm.

49. (Original) The electrochemical gas sensor as defined in claim 48, wherein the sensing and electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm.

50. (Original) The electrochemical gas sensor as defined in claim 47, wherein the electronic and ionic conducting materials of said sensing and counter electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and a second electrical conductor materials.

51. (Original) The electrochemical gas sensor as defined in claim 50, wherein the proton conductor material for both the sensing and counter electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

52. (Original) The electrochemical gas sensor as defined in claim 50, wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum.

53. (Original) The electrochemical gas sensor as defined in claim 50, wherein one of the first and second electrical conductor materials for the counter electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter-reference electrode is 1-50 wt% of Ru oxide.

54. (Original) The electrochemical gas sensor as defined in claim 47, wherein the electrochemical gas sensor is adapted to detect CO.

55. (Original) The electrochemical gas sensor as defined in claim 47, wherein the electrochemical gas sensor is adapted to detect hydrogen.

56. (Original) The electrochemical gas sensor as defined in claim 47, wherein the electrochemical gas sensor is adapted to detect NO_x.

57. (Original) The electrochemical gas sensor as defined in claim 47, wherein the electrochemical gas sensor is adapted to detect H_2O vapor.

58. (Original) The electrochemical gas sensor as defined in claim 47, wherein the electrochemical gas sensor is adapted to detect H_2S.

59. (Original) An electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material and being exposed to the ambient atmosphere;

a porous mixed ionic-electronic conductive reference electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-conductive counter electrode having both an electrical conducting material and an ionic conducting material, and being separate from both said sensing and reference electrodes;

a protonic conductive electrolyte membrane, having top and bottom sides, said top side of said protonic conductive membrane being in contact with the counter electrode and the reference electrode, the bottom side of said protonic conductive membrane being in contact with the sensing electrode;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode;

means for electrical measurement in electrical contact between the sensing electrode and the counter electrode;

means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said reference electrode;

whereby the gas is transported away from the reference electrode when the means for applying a DC power across said protonic electrolyte membrane applies a DC power across said protonic electrolyte membrane; and

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

60. (Original) The electrochemical gas sensor as defined in claim 59, wherein said sensing, count and reference electrodes comprise carbon.

61. (Original) The electrochemical gas sensor as defined in claim 59, wherein said sensing, counter and reference electrodes comprise noble metals.

62. (Original) The electrochemical gas sensor as defined in claim 59, wherein said sensing, counter and reference electrodes comprise conductive metal oxides.

63. (Original) The electrochemical gas sensor as defined in claim 59, wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.

64. (Original) The electrochemical gas sensor as defined in claim 59, wherein the protonic conductive electrolyte membrane is a metal oxide protonic conductor electrolyte membrane.

65. (Original) The electrochemical gas sensor as defined in claim 59, wherein the electrochemical gas sensor is adapted to detect CO.

66. (Original) The electrochemical gas sensor as defined in claim 59, wherein the electrochemical gas sensor is adapted to detect NO_x.

67. (Original) The electrochemical gas sensor as defined in claim 59, wherein the electrochemical gas sensor is adapted to detect hydrogen.

68. (Original) The electrochemical gas sensor as defined in claim 59, wherein the electrochemical gas sensor is adapted to detect H_2S.

69. (Original) The electrochemical gas sensor as defined in claim 59, wherein the electrochemical gas sensor is adapted to detect H_2O vapor.

70. (Original) The electrochemical gas sensor as defined in claim 59, wherein the sensing, counter and reference electrodes have a diameter of about 10 mm, and the protonic conductive electrolyte membrane has a thickness of about 0.17 mm.

71. (Original) The electrochemical gas sensor as defined in claim 59, wherein the electronic and ionic conducting materials of said sensing, counter and reference electrodes are a proton-electron mixed conductive material having 10-50 wt% of a proton conductor material and 50-90 wt% of a first and second electrical conductor materials.

72. (Original) The electrochemical gas sensor as defined in claim 71, wherein the proton conductor material for both the sensing, counter and reference electrodes is a copolymer having a tetrafluorethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

73. (Original) The electrochemical gas sensor as defined in claim 71, wherein one of the first and second electrical conductor materials for the sensing electrode is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the sensing electrode is 1-50 wt% of platinum.

74. (Original) The electrochemical gas sensor as defined in claim 71, wherein one of the first and second electrical conductor materials for the counter and reference electrodes is 50-99 wt% of carbon black, and the other of the first and second electrical conductor materials for the counter and reference electrodes is 1-50 wt% of Ru oxide.

75. (Original) The electrochemical gas sensor as defined in claim 1, wherein the sensing

and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes.

76. (Original) The electrochemical gas sensor as defined in claim 30, wherein the sensing and the counter electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing and counter electrodes.

77. (Original) The electrochemical gas sensor as defined in claim 47, wherein the sensing, counter, first pumping, and second pumping electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, first pumping, and second pumping electrodes.

78. (Original) The electrochemical gas sensor as defined in claim 59, wherein the sensing, counter, and reference electrodes each have a first side opposite a second side, and wherein the ionic and electronic conducting materials are continuous from the first side to the opposite second side within each of the sensing, counter, and reference electrodes.

Claim 79. (New) A two-electrode electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1

mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode;

means for electrical measurement;

said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

80. (New) An electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode;

means for electrical measurement;

said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Claim 81. (New) A two-electrode electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode;

means for electrical measurement;

said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Claim 82. (New) An electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm, the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode;

means for electrical measurement;

said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

Claim 83. (New) The electrochemical gas sensor of claim 82 in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

Claim 84. (New) The electrochemical gas sensor of claim 82 in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.

Claim 85. (New) The electrochemical gas sensor of claim 83 in which the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.

Claim 86. (New) A non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere comprising:

a porous mixed ionic-electronic conductive sensing electrode having both an electronic conducting material and an ionic conducting material;

a porous mixed ionic-electronic conductive counter electrode having both an electronic conducting material and an ionic conducting material;

a first protonic conductive electrolyte membrane in between and in contact with the sensing and counter electrodes, and having a thickness in the range of approximately 0.1 mm to 1 mm;

the sensing electrode reacting with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode;

means for electrical measurement;

said sensing and counter electrodes each having a diameter in the range of approximately 1 mm to 15 mm, and being electrically connected to said electrical measurement means;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.

Claim 87 (New). The non-biased electrochemical gas sensor of claim 86 in which the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

Claim 88 (New). The non-biased electrochemical gas sensor of claim 86 in which the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.

REMARKS

I. Status of the Claims

Original claims 1-78 are present in US Patent No. 5,573,648 (the '648 Patent), as originally issued. New claims 79-88 are presented above.[1] Applicants respectfully request examination of claims 1-88.

II. Introduction to the '648 Patent

As discussed in the Reissue Application Declaration by the Assignee, at the time of filing patent application 381,718, which issued as U.S. Patent No. 5,573,648 on November 12, 1996, Applicants failed to claim inventive methods and apparatus disclosed in the specification of the '648 patent. Applicants have filed this reissue application to remedy this error, and Applicants have now directed claims in this Preliminary Amendment to the inventive methods and apparatus disclosed in the original specification filed on January 31, 1995, but not originally claimed.

The claims of the '648 Patent are directed to gas sensors that are operative to sense a gas in an ambient atmosphere. The gas sensors include sensing and counter electrodes each having both an electronic conducting material and an ionic conducting material and a protonic conductive electrolyte membrane between and in contact with the sensing and counter electrodes. Because the sensing and counter electrodes have both an electronic conducting material and an ionic conducting material, gas sensors based on the subject matter of the '648 Patent typically do not require a power source for sensing of the gas. Thus, the life of any battery used in a commercial sensor covered by the '648 Patent, *e.g.*, a sensor for use as a residential CO sensor, is extended because the battery is only needed to power an alarm.

[1] In the event that the reissue application and the existing reexamination proceeding are merged, new claims 79-88 should be renumbered to be new claims 81-90, respectively.

New claim 79 is similar to original patent claim 1 and also recites that the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

New claim 80 is similar to original patent claim 1 and also recites that the sensing electrode reacts with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.

New claim 81 is similar to original patent claim 1 and also recites that the sensing electrode and the counter electrode are on opposite sides of the first protonic conductive electrolyte membrane, and that the sensing electrode reacts with the gas to produce a change in an electrical characteristic between the sensing electrode and the counter electrode.

New claim 82 is similar to original patent claim 1 and also recites that the sensing electrode and the counter electrode are on opposite sides of the first protonic conductive electrolyte membrane.

New claim 83 depends from new claim 82 and further recites that the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

New claim 84 depends from new claim 82 and further recites that the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.

New claim 85 depends from new claim 83 and further recites that the sensing electrode reacts with the gas in the absence of an applied voltage to the sensing electrode.

New claim 86 is similar to original patent claim 1 and defines a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere. The non-biased electrochemical gas sensor comprises an electrical measurement means that detects changes in an electrical characteristic in the absence of any biasing voltage.

New claim 87 depends from new claim 86 and further recites that the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.

New claim 88 depends from new claim 86 and further recites that the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.

III. <u>Support for New Claims 79-88</u>

Support for new claims 79-88 may be found throughout the specification, claims, figures and abstract as originally filed. Support for new claim 79 may be found, for example, at Figure 1, at claim 1 and Col. 5, lines 30-42.

Support for new claim 80 may be found, for example, at claim 1 and Col. 3, lines 35-37.

Support for new claim 81 may be found, for example, at Figure 1, claim 1 and Col. 3, lines 35-37.

Support for new claim 82 may be found, for example, at Figure 1, at claim 1; and Column 7, line 67 to Column 8, line 1.

Support for new claim 83 may be found, for example, at Figure 1, at claim 1 and Col. 5, lines 30-42.

Support for new claim 84 may be found, for example, at Figure 1, at claim 1 and Col. 3, lines 35-37.

Support for new claim 85 may be found, for example, at Figure 1, at claim 1, at Col. 3, lines 35-37, and at Col. 5, lines 30-42.

Support for new claim 86 may be found, for example, at Figure 1, at claim 1, and at Col. 3, lines 35-37.

Support for new claim 87 may be found, for example, at Figure 1, at claim 1, and at Col. 5, lines 30-42.

Support for new claim 88 may be found, for example, at Figure 1, at claim 1, and at Col. 3, lines 35-37.

IV. Conclusion

Each of new claims 79-88 is directed to subject matter that was originally disclosed but never claimed. Applicants request entry of new claims 79-88 and examination of claims 1-88.

Respectfully submitted,
Shen et al.

Date: 17 July 2003

By: [signature]

Peter D. McDermott (Reg. No. 29,411)
Attorney for Applicants
BANNER & WITCOFF, LTD.
28 State Street, 28th Floor
Boston, MA 02109
Phone: (617) 720-9600
Fax: (617) 720-9601

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee:	**Shen et al.**		
Assignee:	**Atwood Mobile Products, Inc.**		
U.S. Patent No.:	**5,573,648**	**Date Issued:**	**November 12, 1996**
Application No.:	**381,718**	**Date Filed:**	**January 31, 1995**

Title: **GAS SENSOR BASED ON PROTONIC CONDUCTIVE MEMBRANES**

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P.O. Box. 1450
Alexandria, VA 22313-1450

STATEMENT UNDER 37 C.F.R. § 1.178(b)

Dear Sir:

This statement is being made pursuant to 37 C.F.R. § 1.178(b) to call to the attention of the Patent Office that the above-referenced patent, which is the subject of a reissue application, is currently involved in a reexamination proceeding (Reexamination 90/006,208).

In the reexamination proceeding, each of claims 2, 18-74 and 76-78 of U.S. Patent No. 5,573,648 has been found allowable and each of claims 1, 3-17, 75, 79 and 80 stands finally rejected. Further, in the reexamination proceeding, Applicants presented claims 81-83 (which are presented in the reissue application), but the Examiner refused entry of claims 81-83. Patentee filed an Appeal Brief on April 21, 2003 appealing the decision of the Examiner.

Because this reissue application was filed to claim subject matter that was refused entry in the reexamination proceeding, the reissue application and the reexamination proceeding should not be merged and the claims of the reissue application should be examined.

In addition, because the reissue application will be examined and issue long before any decision by the Board of Patent Appeals and Interferences in the reexamination proceeding, the reissue application should not be stayed pending a decision in the reexamination proceeding.

Therefore, because the Patent Office will issue a final decision on the claims presented in the reissue application earlier than any final decision will be entered in the reexamination proceeding, the reissue application should not be merged with the reexamination proceeding, and the reissue application should not be stayed pending a decision in the reexamination proceeding.

Respectfully submitted,
Shen et al.

Date: 17 July 2003

By: [signature]

Peter D. McDermott (Reg. No. 29,411)
Attorney for Applicants
BANNER & WITCOFF, LTD.
28 State Street, 28th Floor
Boston, MA 02109
Phone: (617) 720-9600
Fax: (617) 720-9601